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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/592,032

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Pierpaolo Boffi

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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER  
LLP

901 NEW YORK AVENUE, NW  
WASHINGTON, DC 20001-4413

EXAMINER

SINGH, DALZID E

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/592,032	<b>Applicant(s)</b> BOFFI ET AL.	
	<b>Examiner</b> Dalzid Singh	<b>Art Unit</b> 2613	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-30 and 32 is/are allowed.
- 6) ☒ Claim(s) 16-20, 23, 24 and 31 is/are rejected.
- 7) ☒ Claim(s) 21 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 16-20, 23, 24 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16 and 24 recites "approximately constant". It is unclear what is meant by "approximately" constant since the degree to the approximation is vague. It is unclear how much signal variation can be considered as "approximately" constant.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 16-20, 23, 24 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Webb et al (US Pub. No. 2003/0058508) in view of Ionov (US Pub. No. 20050013543).

Regarding claim 16, Webb et al discloses method for modulating optical radiation, as shown in Fig. 1, comprising the steps of:

phase-modulating the optical radiation with a modulation signal, by using a modulator (13), so as to obtain a multi-level phase shift key optical signal comprising a stream of optical pulses, wherein each of said optical pulses has a respective optical phase value related to said modulation signal; and applying to each of said optical pulses a phase-shift having an absolute value and a sign related, for each of the optical pulses, to said respective optical phase value (see paragraph 0019; the amplitude adjustment inherently has an predetermined absolute value; the sign is considered as positive and negative value).

Webb et al discloses phase modulation and differs from the claimed invention in that Webb et al does not specifically disclose applying an approximately constant phase-shift. Ionov teaches controlling optical pulses by applying constant phase shift

(see paragraph [0024]). Since applying constant phase shift is well known, therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide constant phase shift in order to reduce interference.

Regarding claim 23, wherein said multilevel phase shift key optical signal is a differential multilevel phase shift key optical signal (Webb et al discloses MZ modulator; it is inherent that MZ modulator comprises interferometer which provides differential signal).

Regarding claim 24, Webb et al discloses a method of optical communication comprising transmitting an optical signal at a first location and receiving the optical signal at a second location different from the first location, wherein transmitting comprises modulating the optical signal by performing at least steps of:

phase-modulating (13) the optical signal with a modulation signal, so as to obtain a multi-level phase shift key optical signal comprising a stream of optical pulses, wherein each of said optical pulses has a respective optical phase value related to said modulation signal; and applying to each of said optical pulses a phase-shift having an absolute value and a sign related, for each of the optical pulses, to said respective optical phase value (see paragraph 0019; the amplitude adjustment inherently has an a predetermined absolute value; the sign is considered as positive and negative value).

Webb et al discloses phase modulation and differs from the claimed invention in that Webb et al does not specifically disclose applying an approximately constant phase-shift. Ionov teaches controlling optical pulses by applying constant phase shift

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(see paragraph [0024]). Since applying constant phase shift is well known, therefore it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide constant phase shift in order to reduce interference.

Regarding claims 17-20, Webb et al discloses phase adjustment of the signal and differs from the claimed invention in that Webb et al do not specifically discloses wherein said phase-shift is substantially constant in each of said optical pulses or wherein the absolute value of said phase-shift is equal to or less than about  $\pi/10$  or wherein said modulator has an extinction ratio and the absolute value of said phase-shift is determined as a function of said extinction ratio or wherein the absolute value of said phase-shift is equal to about  $\arctg(1/ER)$ , wherein  $ER_{lin}$  is the extinction ratio. However, Webb et al teaches that the phase is adjustable. Based on this teaching, it would have been obvious to an artisan at the time of the invention to adjust the phase to be within predetermined value. Furthermore, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Swain et al.*, 33 CCPA (Patents) 1250, 156 F.2d 239, 70 USPQ 412; *Minnesota Mining and Mfg. Co. v. Coe*, 69 App D.C. 217, 99 F.2d 986, 38 USPQ 213; *Allen et al. v. Coe*, 77 App D.C. 324, 135 F.2d 11, 57 USPQ 136. In addition, discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Antonie*, 559 F.2d 239, 618, 195 USPQ 6 (CCPA 1977); *In re Aller*, 42 CCPA 824, 220 F.2d 454, 105 USPQ 233 (1955). See also *In re Aller*, 105 USPQ 233 (CCPA 1955) and *In re Boesch*, 617 F.2d

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272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to an artisan of ordinary skill to adjust the phase to an optimum or workable value or range by routine experimentation.

Regarding claim 31, as discussed above Webb et al teaches that the phase is adjustable, therefore it would have been obvious to adjust the phase to output a desired function in order to reduce noise.

### ***Allowable Subject Matter***

5. Claims 25-30 and 32 allowed.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dalzid Singh/  
Primary Examiner  
Art Unit 2613